Ontario

Confined Spaces Guideline

Health and Safety Guidelines

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Occupational Health and Safety Branch
Ministry of Labour

September 30, 2006

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1. INTRODUCTION

The confined space provisions have been amended to ensure that workers entering, working in or working near confined spaces are protected. The confined space requirements are found in the following regulations: Construction Projects, Industrial Establishments, Health Care and Residential Facilities, Mines and Mining Plants, and Confined Spaces. The confined space requirements come into effect on September 30, 2006 and will be enforceable as of this date.
The employer is responsible for ensuring that the requirements of the Occupational Health and Safety Act (OHSA) and its regulations are complied with in the workplace. The employer must ensure that workers are protected, whether or not the confined space provisions apply.

Contravention of any of the requirements of the OHSA and its regulations is an offence which carries a maximum fine of $25,000 or imprisonment for a term of not more than twelve months, or both, for a person. The maximum fine for a corporation is $500,000 per offence.

2. PURPOSE

The purpose of this guideline is to provide workplace parties with guidance on the requirements of the confined space provisions in the regulations under the OHSA.

The guideline does not prescribe how an employer must develop and implement specific components necessary for confined space entry and safe work in confined spaces in order to comply with the regulations; however, it answers common questions about the regulatory provisions. In addition, tables of regulatory provisions for different sectors are provided in each section, where applicable.

The guideline is not intended to replace the regulations. In any case where the guideline may differ from the regulations, the regulatory provisions prevail.

While this guideline will also be available to Ministry of Labour inspectors, they will apply and enforce the regulations based on facts as they may find them in the workplace.

3. APPLICATION

Who is covered by the new and amended confined spaces provisions?

The confined space requirements provide for the protection of most workers in Ontario covered by the OHSA. Confined space provisions found in each sector regulation have been amended:

1. Reg. 851 Regulations for Industrial Establishments as amended by O. Reg. 629/05.
2. O. Reg. 213/91 Regulations for Construction Projects, as amended by O. Reg. 628/05.
3. O. Reg. 67/93 Regulation for Health Care and Residential Facilities as amended by O. Reg. 631/05.
4. Reg. 854 Regulations for Mines and Mining Plants as amended by O. Reg. 630/05.

In addition, the following is a new regulation for confined spaces for most other workplaces that are covered by the OHSA but not by one of the specific sector regulations.

5. O. Reg. 632/05, Regulation for Confined Spaces.

Confined space provisions in all five regulations are similar. However, the confined space provisions for construction projects contain a few more variations; this guideline will highlight these variations, where they exist.

The OHSA and its regulations can be found at www.e-laws.gov.on.ca and at the Ministry of Labour web site www.labour.gov.on.ca

Who is not covered by these provisions?

Workers in federally regulated workplaces, such as federal public servants, railway workers and airline workers are covered by federal labour legislation.

The OHSA, with certain limitations, applies to farm workers as of June 30, 2006. Farm workers are not covered by a confined space regulation. However, the Ministry of Labour (MOL) has worked with farming stakeholders to develop health and safety guidelines to help employers, supervisors and workers on farms to recognize hazards. One of the guidelines addresses hazardous atmospheres

and confined spaces. Separate activities on a farm that are not part of the farming operations and to which the Regulations for Construction Projects (O. Reg. 213/91), Industrial Establishments (Reg. 851), Mines and Mining Plants (Reg. 854), or Health Care and Residential Facilities (O. Reg. 67/93) apply will continue to fall under those regulations and as such the confined space requirements would apply to those activities.

Why is there a separate regulation called "Confined Spaces, O. Reg. 632/05"?

Ontario Regulation 632/05 applies to almost all workplaces covered by the OHSA but not covered by the mining, industrial, construction or health care regulations (with the main exceptions being farming operations and diving operations). The MOL generally refers to these types of workplaces as "extended workplaces", meaning that although the OHSA applies to them, there is no specific sector regulation that applies. Some examples of workers in extended workplaces are provincially regulated truck drivers when on the road, sewer service workers and teachers in educational facilities.

Why are there exceptions?

Only a firefighter as defined in the *Fire Protection and Prevention Act, 1997* and a person who holds a certificate under the *Technical Standards and Safety Act, 2000* working under the direction of a fire department may perform emergency work. Hazard recognition and other general training requirements continue to apply.

"Emergency work", as defined in each regulation, means "work performed in connection with an unforeseen event that involves an imminent danger to the life, health or safety of any person."

There may be situations in which these workers must enter a confined space in order to perform emergency work, and it would not be reasonable to require that all of the administrative steps be taken prior to entry. In order for the exception to apply, the employer of the firefighter or gas technician must provide written procedures and other measures, confined space training, and personal protective equipment, clothing and devices to protect the workers during the emergency work.

I am an employer and my workplace has a confined space. I contract out work to be done in the confined space. Do these provisions apply to me?

Yes. Contracting out work for services makes you an employer, as defined under the OHSA. The general duties of the employer under the OHSA would apply, regardless of the situation. Therefore you have to ensure that workers who you have hired comply with the confined spaces provisions.

Refer to the multiple employer section when there are workers of more than one employer required to work in the same confined space.

Constructor duties, as defined under the OHSA would apply on construction projects.

I am a provincially regulated employer, who often is contracted by a federally regulated business, for federal business. Sometimes, we may also work with federal companies but for our own business. How would the regulations apply?

Provincially regulated workers, who occasionally work at or on a federal undertaking, are still subject to the authority of the OHSA and may also be subject to federal safety legislation. However, jurisdiction is determined on a case-by-case basis, and employers may wish to contact the local office of the Ministry of Labour for further information pertaining to their specific situations.

Please refer to the Blue Pages of your telephone directory to find the local MOL office.

4. CONFINED SPACES

The definition of 'confined space' is consistent across all regulations.

"confined space" means a fully or partially enclosed space,

(a) that is not both designed and constructed for continuous human occupancy, and

(b) in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it."

If you have a space that is fully or partially enclosed, the two conditions - (a) and (b) above - must both apply before the space can be considered a "confined space".

Do I have a confined space in my workplace?

To determine whether a "space" meets the definition of a confined space consider the following 3 questions:

- Is the space fully or partially enclosed?
- Is the space not both designed and constructed for continuous human occupancy?
- Might an atmospheric hazard occur?

The only way to determine if a "space" meets the definition for a "confined space" is to evaluate it. How the evaluation is done is up to the employer.

If you have a fully or partially enclosed space:

Is it designed and constructed for continuous human occupancy?	Might an atmospheric hazard occur?	Is it a confined space?
Yes	Yes	No
Yes	No	No
No	Yes	Yes
No	No	No

We have determined a specific space not to be a confined space as per the regulations, but still prefer to conduct some air sampling prior to entering just to ensure that nothing unforeseen has occurred. Does this mean that we have to implement a confined space program for this space?

No, assuming this space was properly evaluated ahead of time and deemed not to be a confined space as per the definition. However, there is nothing preventing employers from taking any additional precautionary measures for any other spaces outside of this regulation, including air sampling as an example.

Is there a difference between a "restricted space" and a "confined space"?

Yes. Only the Regulation for Health Care and Residential Facilities (O. Reg. 67/93) speaks of a "restricted space" in section 42. In this regulation a restricted space refers, in part, to a "space from which the egress of a worker is restricted, limited, or impeded". A "restricted space" may also be a confined space, depending on whether atmospheric hazards may occur in that space.

HUMAN OCCUPANCY

To determine if a space is designed and constructed for human occupancy, we must look at the intent and construction of the space – what is the purpose of the space, or in other words, what was it intended for, and to what standards has it been designed and constructed to allow people to occupy it?

Workspaces such as offices, arenas, maintenance rooms, control rooms, etc., are obvious places that are designed for humans to occupy for long periods of time (continuously). These spaces are not considered a confined space, regardless of the atmospheric hazards that may occur in them. However, occupational health and safety legislation and regulations apply and must be complied with to protect workers.

Although the regulations do not define human occupancy, the Ministry of Labour uses the term 'continuous human occupancy' to refer to a space that has been designed and constructed in accordance with recognized codes and standards that contain provisions to make the space suitable for humans to occupy, such as provisions for structural adequacy, access and egress, ventilation and lighting such that a human could continually occupy that space. Examples of codes and standards are the Ontario Building Code, the Ontario Fire Code, and CSA B52 (Mechanical Refrigeration Code).

Other spaces, such as parts of a tunnelling operation or an underground mine (stopes, drifts, ramps, shafts, raises), are designed and constructed specifically for people to carry out work within them. Specific codes and standards and requirements are intended to make the space adequate for the health and safety of workers. However, parts of a tunnel or mine could be confined spaces. Tunnels and mines could also include confined spaces within them, such as bins and tanks.

Some examples of spaces that would not be considered as "both designed and constructed for human occupancy" are:

- storage tanks, tank cars, process vessels, boilers, pressure vessels, vats, bins, silos, bag-houses and other tank like compartments usually having only a manhole for entry
- open topped spaces such as pump wells, augured caissons, pits or degreasers
- pipes, sewers, ducts and similar structures
- cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks and void spaces
- chutes, mill holes, ore bins, inside of a skip hanging in a shaft, crusher jaws
- flues, chimneys, ovens or furnaces.

Structures such as vessels, sewers and tank cars are designed and constructed to play a role in part of a process. Their primary purpose is to contain, transport, move or manipulate materials or equipment and they are not primarily designed for people to occupy them. They may have structures such as ladders or platforms where workers can perform work within the space on occasion. However, these spaces were not designed for human occupancy.

A construction project space that is intended for human occupancy but not yet completed in its construction is not considered a confined space if its stage of construction is suitable for continuous human occupancy. Some construction spaces such as sumps and tanks and projects within these spaces will be confined spaces, but not projects in general.

A chamber or vault may have cooling ventilation for equipment purposes and have a temporary access space, designed to allow workers to access pipes and equipment (perhaps by using ladders or a door). However, this does not mean that it has been designed to meet codes and standards that would allow workers to safely perform their duties on a regular basis within the chamber or vault.

Therefore, these spaces are considered NOT to be both designed and constructed for human occupancy.

What are examples of spaces that are both designed and constructed for continuous human occupancy?

Some examples include offices, service rooms (such as mechanical rooms, elevator rooms), shops, walk-in freezers and refrigerators, laboratories, flammable liquid storage and dispensing rooms, and rooms equipped with approved fire suppression systems.

What if I cannot determine if a space is not designed and constructed for human occupancy?

Where it is not obvious and your evaluation does not determine whether a workspace is or is not designed for human occupancy, consider whether or not there may be an atmospheric hazard present because of its design, construction or location and the work to be performed.

If it is determined that no atmospheric hazard may occur, then the confined space provisions would not apply in any case, and the human occupancy question need not be considered.

Where an atmospheric hazard may exist and you are still uncertain as to whether the space is designed for human occupancy, it may then be a reasonable precaution to comply with the confined space provisions.

ATMOSPHERIC HAZARDS

The definition of 'atmospheric hazards' is consistent across all regulations.

"atmospheric hazards" means,

(a) accumulation of flammable, combustible or explosive agents,

(b) an oxygen content in the atmosphere that is less than 19.5 per cent or more than 23 per cent by volume, or

(c) the accumulation of atmospheric contaminants, including gases, vapours, fumes, dusts or mists, that could,

(i) result in acute health effects that pose an immediate threat to life, or

(ii) interfere with a person's ability to escape unaided from a confined space.

In the definition of a confined space, what is meant by "in which atmospheric hazards may occur"?

The intent of this wording is to ensure that consideration is given to atmospheric hazards that may exist in the space or that may occur due to the following:

- The construction of the space
- The location of the space
- The contents of the space
- The work being done in the space.

The evaluation of the space to determine if the regulatory requirements apply may include consideration of previous data (including air sampling), knowledge of the process and space, data on space configuration (size, design, areas for pocketing, double wall, etc.) and knowledge and data on the generation and accumulation of contaminants. Historical information, such as previous incidents that occurred in the specific space or similar spaces, or incidents that have occurred with similar processes, should also be taken into account.

What are possible sources of atmospheric hazards?

Sources of atmospheric hazards may include:

1. Previous contents of the space. An example would be a tank with a residual amount of organic solvent in it, such as perchloroethylene.
2. Atmospheric hazards generated from chemical reactions of materials present in the space. An example would be the decomposition of organic materials that would cause the formation of methane, a flammable gas, and hydrogen sulphide, a toxic atmospheric contaminant. Another example would be rusting, or oxidation, within a confined space that would consume oxygen and cause an oxygen deficiency.
3. Activities performed in or about the space. Examples include welding, which generates welding fumes, and solvent cleaning, which generates solvent vapours.
4. Hazardous contaminants that may inadvertently enter into the space from adjacent processes or locations. An example would be carbon monoxide from vehicle exhaust entering street manholes or a trench.

What is a "flammable gas"?

A "flammable gas" is a gas that is capable of being ignited and burned when mixed with the proper proportions of air, oxygen or other oxidizer.

Note: A "flammable gas" is defined by the National Fire Protection Association (NFPA) as a gas at 68°F (20°C) or less at an absolute pressure of 14.7 psia (101.325 kPa), that is ignitable at an absolute pressure of 14.7 psia (101.325 kPa) when in a mixture of 13 percent or less by volume with air, or that has a flammable range at an absolute pressure of 14.7 psia (101.325 kPa) with air of at least 12 percent, regardless of the lower limit.

What is a "flammable vapour"?

A "flammable vapour" is the vapour generated by a flammable liquid that is capable of being ignited and burned when mixed with the proper proportions of air, oxygen, or other oxidizer.

What is a "flammable liquid"?

A "flammable liquid" means a liquid with a flash point below 37.8 degrees Celsius and a vapour pressure not exceeding 275 kilopascals absolute at 37.8 degrees Celsius.

What is meant by "atmospheric contaminants, including gases, vapours, fumes, dusts or mists that could result in acute health effects that pose an immediate threat to life or interfere with a person's ability to escape unaided from a confined space"?

This refers to toxic airborne agents that when inhaled in high concentrations could cause acute health effects shortly after an overexposure. Acute health effects may include very serious outcomes such as impairment of judgement, unconsciousness, and death. Acute health effects such as irritation, narcosis or anaesthesia could also interfere with a person's ability to escape unaided from the exposure situation. Examples of symptoms that may lead to acute health effects include burning eyes, coughing, dizziness, nausea, disorientation, lack of coordination, headache, or other symptoms that manifest immediately following the exposure. If such symptoms are experienced upon entry, it is Important that an evaluation be undertaken to determine if there is a possibility of health effects that could cause unconsciousness or death and as such require compliance with confined space entry requirements.

What is the connection between the phrase, "atmospheric contaminants, including gases, vapours, fumes, dusts or mists that could result in acute health effects that pose immediate threat to life or interfere with a person's ability to escape unaided from a confined space" and the phrase, "airborne contaminants with IDLH levels"?

"Atmospheric contaminants" is meant to have a similar meaning to "airborne contaminants" with IDLH levels when referring to airborne contaminants with acute toxicity. Both relate to overexposure that could interfere with a person's ability to escape unaided from a confined space.

IDLH (Immediately Dangerous to Life or Health) levels for air contaminants are used by NIOSH (National Institute for Occupational Safety and Health) for the selection of respiratory protection against airborne contaminant exposure. Generally speaking, the IDLH level of airborne contaminants is considered to be a concentration that is immediately dangerous to life or health because the IDLH concentration could cause escape-impairing symptoms or acute irreversible health effects.

Is the application of confined space provisions triggered by potential exposure to IDLH levels of air contaminants?

A confined space is a space not designed for continuous human occupancy in which atmospheric hazards *may* occur. As such, confined space provisions are triggered by exposure or potential exposure to immediately dangerous to life or health (IDLH) contaminant concentrations. In some circumstances, it may be difficult to determine if or when the exposure may reach the IDLH level. The physical condition of a confined space could allow the accumulation of atmospheric contaminants to IDLH levels in a short period of time.

What does 'escape unaided' mean?

It means being able to escape without the assistance of respiratory protection, emergency equipment or other devices, or other persons.

If measures and/or controls are taken to control hazards in a space prior to workers entering it, do we still need to consider it a confined space?

Control measures, such as continuous mechanical ventilation to ensure that the concentrations of an atmospheric hazard are controlled or maintained at an appropriate level, would not *eliminate* the possibility of a potential atmospheric hazard, and therefore the space would be considered a confined space.

If measures are implemented to *eliminate* the possibility that any atmospheric hazards may occur in a space, then the confined space provisions would no longer need to apply. *Elimination* of an atmospheric hazard occurring is different from the *control* of the hazard. If workers must enter the confined space to eliminate the hazards (steam cleaning, for example), then the regulations would apply during the cleaning process.

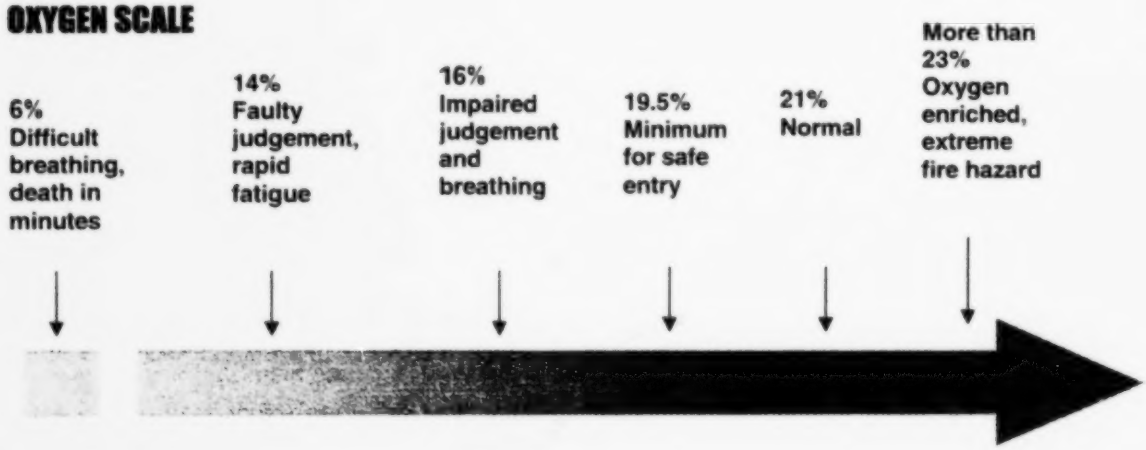
Every confined space can be unique and must be thoroughly evaluated to determine whether or is possible to eliminate the potential for an atmospheric hazard to occur.

Note that even if a space might not be a confined space under the regulations, the employer must take every precaution reasonable in the circumstances to protect workers entering the space.

What are the hazards of oxygen deficiency or enrichment?

If the concentration of oxygen falls below the acceptable limit of 19.5%, the space is oxygen-deficient. This hazard is a significant cause of many fatalities in confined spaces. Oxygen deficiency may occur from biological or chemical reactions such as rusting, or by displacement of oxygen by other gases.

If the concentration exceeds the limit of 23%, then the space is oxygen-enriched, increasing the likelihood of explosions or fires by increasing the potential of any combustible or flammable material to be ignited as well as the rate of reaction. Oxygen enrichment may occur from leaking gases, welding equipment, or oxygen lines that have not been blanked.



5. THE PROGRAM

Industrial Establishments: Section 119.4	(1) If an employer's workplace includes a confined space that workers may enter to perform work, the employer shall ensure that a written program for the confined space is developed and maintained in accordance with this [Part/Regulation] before a worker enters the confined space.
Health Care and Residential Facilities: Section 43.3	(2) The program may apply to one or more confined spaces. (3) The program shall be developed and maintained in consultation with the joint health and safety committee or the health and safety representative, if any.
Mines and Mining Plants: Section 297	(4) The program shall be adequate and shall provide for, (a) a method for recognizing each confined space to which the program applies; (b) a method for assessing the hazards to which workers may be exposed, in accordance with section [referring to assessment section] (c) a method for the development of one or more plans, in accordance with section *[referring to plan section];* (d) a method for general training of workers, in accordance with section [*referring to general training section];* and (e) an entry permit system that sets out the measures and procedures to be followed when work is to be performed in a confined space to which the program applies.
Confined Spaces: Section 5	(5) The employer shall provide a copy of the program to the joint health and safety committee or the health and safety representative, if any. (6) The employer shall ensure that a copy of the program is available to, (a) any other employer of workers who perform work to which the program relates; and (b) every worker who performs work to which the program relates, if the workplace has no joint health and safety committee or health and safety representative.

Construction Projects: Section 221.5	(1) If a project includes a confined space that workers may enter to perform work, the employer shall ensure that a written program for the confined space is developed and maintained in accordance with this Part before a worker enters the confined space. (2) The program may apply to one or more confined spaces. No requirement for the program to be developed and maintained in consultation with the JHSC or HS Representative. (3) The program shall be adequate and shall provide for, (a) Same as the other regulations (b) Same as the other regulations (c) Same as the other regulations (d) a method for the training of workers, in accordance with section 221.8; and (e) Same as the other regulations (4) The employer shall provide a copy of the program to the constructor, who shall provide a copy of it to the project's joint health and safety committee or health and safety representative, if any. (5) Similar to (6) above, though note use of 'constructor' instead of 'employer' and 'project JHSC' instead of 'workplace JHSC'.

What does a confined space program include?

A confined space program is a written document that includes: a method for recognizing each confined space to which the program applies; a method for assessing the hazards to which workers may be exposed; a method for the development of confined space entry plans (which include on-site rescue procedures); a method for training workers; and, an entry permit system.

A method is a process which the employer will use to implement the various elements of the program.

May I have an outside contractor develop a confined space program in order for workers to enter my confined space?

Yes, you may have an outside contractor develop a confined space program for your workplace; however, as an employer or a contractor, you retain your responsibilities under the OHSA, and are ultimately accountable for the health and safety of all workers at your workplace.

All employers who have a confined space into which workers may enter to perform work are required to develop and maintain a confined space program.

Where there are multiple employers of workers in a space, then the multi-employer provisions would apply.

When a confined space is part of a construction project, which employer is responsible for developing and maintaining the program?

Each employer of workers entering the confined space or each employer who contracts out entry to a confined space is responsible for ensuring compliance with the confined space requirements. A copy of the program or programs for the confined space must be developed by the employer(s) and provided to the constructor.

Where there are multiple employers of workers who will enter a confined space see Section 8.

May I have one program for all confined spaces in my workplace?

Yes, the program is intended for all confined spaces in the workplace and as such it is important to adequately address all confined spaces in that workplace. For employers with multiple locations, the regulations do not prohibit the development of one program as long as it adequately addresses the confined spaces in each location. The employer must consult with the joint health and safety committee (JHSC) or health and safety representative, if any, on the development and maintenance of the program for each specific workplace to which it applies (except for construction projects).

6. HAZARD ASSESSMENT

Industrial Establishments: Section 119.5 Mines and Mining Plants: Section 298 Health Care and Residential Facilities: Section 43.4 Confined Spaces: Section 6	(1) Before any worker enters a confined space, the employer shall ensure that an adequate assessment of the hazards related to the confined space has been carried out. (2) The assessment shall be recorded in writing and shall consider, with respect to each confined space, (a) the hazards that may exist due to the design, construction, location, use or contents of the confined space; and (b) the hazards that may develop while work is done inside the confined space. (3) The record of the assessment may be incorporated into an entry permit under section [specific number] (4) If two or more confined spaces are of similar construction and present the same hazards, their assessments may be recorded in a single document, but each confined space shall be clearly identified in the assessment. (5) The employer shall appoint a person with adequate knowledge, training and experience to carry out the assessment and shall maintain a record containing details of the person's knowledge, training and experience. (6) The assessment shall contain the name of the person who carries out the assessment. (7) The person shall sign and date the assessment and provide it to the employer. (8) On request, the employer shall provide copies of the assessment and of the record mentioned in subsection (5) to, (a) the joint health and safety committee or the health and safety representative, if any; or b) every worker who performs work to which the assessment relates, if the workplace has no joint health and safety committee or health and safety representative. (9) The employer shall ensure that the assessment is reviewed as often as is necessary to ensure that the relevant plan remains adequate.

Construction Projects: Section 221.6	(1) Before any worker enters a confined space, the employer shall ensure that an adequate assessment of the hazards related to the confined space has been carried out by a competent worker. (2) The assessment shall be recorded in writing and shall consider, with respect to each confined space, (a) the hazards that may exist due to the design, construction, location, use or contents of the confined space; and (b) the hazards that may develop while work is done inside the confined space. (3) The record of the assessment may be incorporated into an entry permit under section 221.9. (4) If two or more confined spaces are of similar construction and present the same hazards, their assessments may be recorded in a single document, but each confined space shall be clearly identified in the assessment. (5) The employer shall maintain a record containing details of the knowledge, training and experience of the competent worker who carries out the assessment. (6) The assessment shall contain the name of the competent worker who carries out the assessment. (7) The competent worker shall sign and date the assessment and provide it to the employer. (8) On request, the employer shall provide copies of the assessment and of the record mentioned in subsection (5) to, (a) the project's joint health and safety committee or health and safety representative, if any; or (b) every worker who performs work to which the assessment relates, if the project has no joint health and safety committee or health and safety representative. (9) The employer shall ensure that assessments of confined spaces at the project are reviewed as often as is necessary to ensure that the relevant plans remain adequate.

Before any worker enters a confined space, the employer shall ensure that an adequate assessment of the hazards related to the confined space has been carried out.

The hazard assessment is not intended for the purpose of evaluating whether or not a space is a confined space. The assessment is intended to be carried out as part of the entry preparation process. It is critical to identifying the existing

hazards of individual confined spaces, and the hazards that may develop during the work activity inside the confined space. In addition to assessing the atmospheric hazards that pose an imminent danger to workers, the employer should also assess general safety and health hazards present in the space.

The assessment may include the following hazards:

- Oxygen deficiency/oxygen enrichment
- Flammable, combustible or explosive agents
- Toxic air contaminants, smoke, fumes, and dusts and corresponding OELs
- Residual chemicals/materials
- Ignition hazards, including hot work, tools and other potential sources of ignition
- Chemical contact hazards, including acids, alkalis
- Physical hazards, including mechanical hazards, thermal stress, humidity, radiation, noise and vibration, working/walking surfaces, engulfing materials, physical obstacles, poor visibility
- Electrical hazards, including lines and cables, exposed terminals
- Traffic hazards, including pedestrian, mobile equipment
- Biological hazards, including animals and biological agents
- Other hazards related to the confined space, including piping/distribution systems, pressurizing fluids, any type of uncontrolled energy (water, liquid, vapour, electric, magnetic, gaseous, etc.), limited access and egress

A hazard assessment must be completed by a person with adequate knowledge, training and experience to be able to perform the assessment, or by a competent worker on construction projects. This written assessment must be completed, signed, and dated prior to any worker entering a confined space.

The employer must maintain a record containing details of the person's (or competent worker's) knowledge, training and experience. The employer must have the assessment reviewed as often as necessary to ensure that the resulting plan is adequate. A record of the assessment may be incorporated into the entry permit.

Is a hazard assessment required for each confined space entry?

The assessment must be carried out before any worker enters a confined space. It should be repeated each time that there is a new entry permit issued for work to be done in a confined space. This is because the employer must ensure that there are no new hazards that have developed since the last time that the assessment was carried out. In addition, a different work activity could result in different hazards. However, an assessment is not needed each time a worker goes in and out of the confined space during the period to which an entry permit applies.

A confined space entry is described on the entry permit with respect to its duration, its location and the work to be done during that entry. The entry permit may include provisions for exiting the confined space and then returning back to it. These procedures, which could include atmospheric testing and other re-assessment activities, should be identified on the entry permit.

Where the same space is entered for the same type of work at a time not covered by the entry permit, the previous assessment would be useful as a reference. However, the only way to determine whether the hazards in the confined space are unchanged is to complete an assessment.

Can assessments for different spaces be combined into one document?

Assessments for individual confined spaces would normally be written as separate documents. However, where two or more confined spaces are similar in construction and have the same hazards, the assessment for each specific confined space may be recorded in a single document. It is important to clearly identify the specific confined space or spaces to which each assessment applies.

Can I categorize spaces before an assessment is made?

Each confined space would still require an assessment to confirm its category. Some workplaces have several types of confined spaces and have categorized them to use specific/generic controls in the plan. Each category may have measures and procedures to be followed to adequately protect workers for a confined space entry.

When is a hazard assessment supposed to be completed?

A hazard assessment needs to be completed, signed and dated before a worker enters a confined space.

Would I comply if I hire a consultant with the adequate knowledge, training and experience to conduct the assessment?

Yes, except for construction projects (on a project, a consultant would have to meet the requirements of a competent worker in the construction regulations). An employer may set out in the program that the method for assessing the hazards to which workers may be exposed will be conducted by a consultant with the adequate knowledge, training and experience. The employer would be responsible for familiarizing the consultant with the process and the work to be performed. In those instances where the employer had put a program in place and where that same employer would have called for a consultant to conduct the assessment, it is the responsibility of the employer to give to that consultant a copy of the confined space program.

What should be considered in the assessment of potential atmospheric hazards?

Identification of the potential atmospheric hazards should be done taking into consideration the previous contents of the space, the activities or work tasks within the space that could generate or stir up air contaminants and the potential for the sudden release of air contaminants from sources in proximity to the space.

7. THE PLAN

Industrial Establishments: Section 119.6 Health Care and Residential Facilities: Section 43.5 Mines and Mining Plants: Section 299 Confined Spaces: Section 7	(1) Before any worker enters a confined space, the employer shall ensure that an adequate written plan, including procedures for the control of hazards identified in the assessment, has been developed and implemented by a competent person for the confined space. (2) The plan may be incorporated into an entry permit under section [specific number]. (3) The plan shall contain provisions for, (a) the duties of workers; (b) co-ordination in accordance with section [specific number], if applicable; (c) on-site rescue procedures, in accordance with section [specific number]; (d) rescue equipment and methods of communication, in accordance with section [specific number]; (e) personal protective equipment, clothing and devices, in accordance with section [specific number]; (f) isolation of energy and control of materials movement, in accordance with section [specific number]; (g) attendants, in accordance with section [specific number]; (h) adequate means for entering and exiting, in accordance with section [specific number]; (i) atmospheric testing, in accordance with section [specific number]; (j) adequate procedures for working in the presence of explosive or flammable substances, in accordance with section [specific number]; and (k) ventilation and purging, in accordance with section [specific number]. (4) One plan may deal with two or more confined spaces that are of similar construction and present the same hazards as identified by the assessment. (5) The employer shall ensure that the plan is reviewed as often as is necessary to ensure that it remains adequate.

Construction Projects: Section 221.7	(1) and (2) and (3) (a) to (d) are the same as in the above provisions. (3) (e) protective clothing and personal equipment and devices, in accordance with section 221.12; (3) (f) and (g) are the same as the above provisions (3) (h) adequate means of access and egress; (3) (i) to (k) and (4) and (5) are the same as the above provisions

What is the difference between a program and a plan?

A program sets out the methods by which an employer intends to comply with the regulation, such as how to recognize confined spaces, how assessments will be carried out, how plans will be developed, how training will be delivered and what the entry permit system will be.

A plan is a specific set of measures and procedures to control hazards identified by the assessment for that confined space to allow workers to enter and work in a specific confined space safely. The plan must include provisions for on-site rescue procedures, rescue equipment and methods of communication, in addition to the other provisions listed above.

Can my program replace the plan?

No. The program sets out the methods and processes for safe work in confined spaces in your workplace whereas the plan, which may deal with two or more confined spaces of similar construction and same hazards, includes procedures for the control of hazards identified in the assessment. The plan for a confined space must be flexible to respond to the hazard assessment carried out for a specific entry.

Are my standard operating procedures good enough to constitute a plan?

It depends on the situation, since standard operating procedures may differ from one employer to the next. Some may include provisions for compliance with the program, while others may be measures and procedures to enter and would be more consistent with a plan. The plan for a specific confined space must be flexible to respond to the hazard assessment carried out for a specific entry; standard operating procedures often are not as readily revised or extensive enough to deal with different situations.

8. COORDINATION DOCUMENT

Industrial Establishments: Section 119.3 Health Care and Residential Facilities: Section 43.2 Mines and Mining Plants: Section 296 Confined Spaces: Section 4	(1) This section applies if the workers of more than one employer perform work in the same confined space or related work with respect to the same confined space. (2) Before any worker enters the confined space or begins related work with respect to the confined space, the lead employer shall prepare a co-ordination document to ensure that the duties imposed on employers by sections (all sections with the exception of general training, personal protective equipment and records) are performed in a way that protects the health and safety of all workers who perform work in the confined space or related work with respect to the confined space. (3) Without restricting the generality of subsection (2), the co-ordination document may provide for the performance of a duty or duties referred to in that subsection by one or more employers on behalf of one or more other employers, with respect to some or all of the workers. (4) A copy of the co-ordination document shall be provided to, (a) each employer of workers who perform work in the same confined space or related work with respect to the same confined space; and (b) the joint health and safety committee or health and safety representative, if any, for each employer of workers who perform work in the same confined space or related work with respect to the same confined space.
Construction Projects : Section 221.4	(1) This section applies if the workers of more than one employer perform work in the same confined space or related work with respect to the same confined space. (2) Before any worker enters the confined space or begins related work with respect to the confined space, the constructor shall prepare a co-ordination document to ensure that the duties imposed on employers by this Part are performed in a way that protects the health and safety of all workers who perform work in the confined space or related work with respect to the confined space. (3) A copy of the co-ordination document shall be provided to, (a) each employer of workers who perform work in the same confined space or related work with respect to the same confined space; and (b) the project's joint health and safety committee or health and safety representative, if any.

The multi-employer section of the confined spaces provisions does not diminish employer duties under the OHSA. It is intended to ensure that employers of workers working in a confined space are aware of potential or existing hazards that may be introduced by one or the other employer, and that there is communication between the employers in order to ensure worker safety. This section is also intended to reduce duplication with respect to requirements such as assessment, plan, and entry permits. However, this sharing of tasks does not diminish an employer's duties. Each employer is required to ensure compliance with the regulations.

With the exception of construction projects, the coordination document does not allow for the sharing of responsibilities for general training, personal protective equipment and records.

Is a coordination document required where my workers will not enter a space, and only one contractor is necessary?

No, the coordination document is only required where workers of more than one employer perform work in the same confined space or *related* work with respect to the same confined space. Workers may be working in the space at the same time, or consecutively.

"Related work" is defined as "work that is performed near a confined space in direct support of work inside the confined space".

Who is responsible for the confined space entry if the employer contracts the job out to a contractor or several contractors?

An employer may decide to contract out work to those with specific expertise; however, an employer cannot contract out its duties as an employer under the OHSA. The employer must ensure that the workers work in compliance with the confined spaces requirements.

Who is responsible for the coordination document?

With the exception of construction projects, the coordination document must be prepared by the "lead employer". The "lead employer" is defined as an employer who contracts for the services of one or more other employers or independent contractors in relation to one or more confined spaces that are located either in the lead employer's workplace or in another employer's workplace.

The coordination document must ensure that employer duties with respect to the following subject matters are performed in a way that protects the health and

safety of all workers who perform work in the confined space or related work with respect to the confined space:

(a) confined space program;
(b) hazard assessment;
(c) written plan;
(d) plan-specific training (if applicable);
(e) entry permits;
(f) written on-site rescue procedures and equipment;
(g) isolation of energy and control of materials movement;
(h) attendants;
(i) entering and exiting;
(j) unauthorized entry;
(k) atmospheric testing;
(l) explosive and flammable substances; and
(m) ventilation and purging of atmospheric hazards.

The constructor is responsible for the preparation of the coordination document if more than one contractor is hired to perform work in the same confined space or related work with respect to the same confined space on a construction project.

9. TRAINING

With the exception of construction, each regulation has two sections focused on training: 1) hazard recognition and other general training, and 2) plan-specific training. The construction regulation has only one section.

Industrial Establishments: Section 119.7 Mines and Mining Plants: Section 300 Health Care and Residential Facilities: Section 43.6 Confined Spaces: Section 8	**Hazard Recognition and Other General Training** (1) Every worker who enters a confined space or who performs related work shall be given adequate training for safe work practices for working in confined spaces and for performing related work, including training in the recognition of hazards associated with confined spaces. (2) The employer shall appoint a person with adequate knowledge, training and experience to conduct the training. (3) The employer shall ensure that training under this section is developed in consultation with the joint health and safety committee or the health and safety representative, if any. (4) The employer shall ensure that training under this section is reviewed, in consultation with the joint health and safety committee or the health and safety representative, if any, whenever there is a change in circumstances that may affect the safety of a worker who enters a confined space in the workplace, and in any case at least once annually. (5) The employer shall maintain up-to-date written records showing who provided and who received training under this section, the nature of the training and the date when it was provided. (6) The records may be incorporated into an entry permit under section [referring to entry permit section]. (7) Training under this section may be combined with training under section [referring to plan-specific training section].
Industrial Establishments: Section 119.8 Mines and Mining Plants: Section 301 Health Care and Residential Facilities: Section 43.7 Confined Spaces: Section 9	**Plan-Specific Training** (1) The employer shall ensure that every worker who enters a confined space or who performs related work, (a) receives adequate training, in accordance with the relevant plan, to work safely and properly; and (b) follows the plan. (2) The employer shall maintain up-to-date written records showing who provided and who received training under this section, and the date when it was provided. (3) The records may be incorporated into an entry permit under section [referring to entry permit section]. (4) Training under this section may be combined with training under section [referring to general training section].

Construction Projects: Section 221.8	(1) The employer shall ensure that every worker who enters a confined space or who performs related work receives adequate training to perform the work safely, in accordance with the relevant plan. (2) Training under subsection (1) shall include training in, (a) the recognition of hazards associated with confined spaces; and (b) safe work practices for working in confined spaces and for performing related work. (3) The employer shall maintain up-to-date written records showing who provided and who received training under this section and the date when it was provided. (4) The employer shall provide the training records under subsection (3) to the project's joint health and safety committee or health and safety representative, if any, on request. (5) The records may be incorporated into an entry permit under section 221.9.

What training will be required in order to enter confined spaces?

Every worker who works in a confined space must receive adequate training in the recognition of hazards associated with confined spaces and training to be able to safely perform the assigned duties for that specific confined space. Training is also required for persons contributing to the work activity, even those not entering the confined space, for example, attendants and rescue workers.

Rescue personnel require training in on-site rescue procedures, first aid and cardiopulmonary resuscitation and the use of the specific rescue equipment required. On-site rescue procedures should be practiced so as to ensure a high level of proficiency.

Giving instructions to a confined space worker does not ensure that the worker is competent to safely perform work. Hands-on training should be an essential part of the confined space training. In cases where a worker is new to the job and does not have sufficient experience, one effective means of ensuring the new worker obtains adequate experience and training would be to have the worker teamed up with more experienced workers.

Every worker that enters a confined space must be adequately trained in accordance with the plan. Elements of the plan may include but are not necessarily limited to the following:

- Recognition and identification of potential hazards associated with the confined spaces that will be entered.
- Evaluation and control procedures for the identified or potential hazards.
- All equipment such as ventilation equipment (blowers), harnesses and air quality monitors (e.g., Oxygen/combustible meters) that will be used while in the confined space.
- All personal protective equipment (e.g., respirators) that the worker will be using while in the confined space.
- All procedures for entering the confined space.
- Procedures to follow in the event of a situation developing that could present additional risk to the worker or an emergency.
- The specific work to be done while in the confined space.

Workers with emergency rescue responsibilities will need training related to the rescue.

All confined space training should include some hands-on training with the safety equipment including the personal protective equipment and safety harnesses.

Although records of training must be kept, they may be recorded on the entry permit by incorporating the record into the permit, which must be kept.

Do I have to provide refresher training?

Refresher training is not specifically required, but a review of training is required on an annual basis and whenever there is a change in circumstances that may affect the safety of a worker who enters a confined space in the workplace, such as a change in process. A review is not the same as providing annual training.

However, the employer must ensure that the confined space training is adequate. Where the review determines the training not to be adequate, additional training should be provided. Refresher training at intervals determined by the specific conditions of the workplace may be needed.

May I purchase a training program or contract it out?

The hazard recognition and general part of the training could be purchased or contracted out. However, this training might need to be supplemented by plan specific training to ensure the workers are adequately trained. If any training is

contracted out, it remains the responsibility of the employer to ensure the adequacy of the training delivered to the workers.

May I use web-based training?

Web-based training could be part of your training. However, the training may be supplemented with the plan-specific training. Regardless of the source of training or how it is provided to workers, the employer has the duty to ensure it is adequate to protect the health and safety of the workers who work in or around the confined space.

Does a trainer or a training organisation have to be certified to provide confined space training?

No. There is no certification process for trainers, workers, training programs or agencies at this time. It is up to the employer, in consultation with the JHSC or health and safety representative, if any, to determine the level and type of training provided, and to ensure it is adequate for the type of entry being conducted.

10. ENTRY PERMIT

Industrial Establishments: Section 119.9 Construction Projects: Section 221.9 Mines and Mining Plants: Section 302 Health Care and residential Facilities: Section 43.8 Confined Spaces: Section 10	(1) The employer shall ensure that a separate entry permit is issued each time work is to be performed in a confined space, before any worker enters the confined space. (2) An entry permit shall be adequate and shall include at least the following: 1. The location of the confined space. 2. A description of the work to be performed there. 3. A description of the hazards and the corresponding control measures. 4. The time period for which the entry permit applies. 5. The name of the attendant described in section [specific number]. 6. A record of each worker's entries and exits. 7. A list of the equipment required for entry and rescue, and verification that the equipment is in good working order. 8. Results obtained in atmospheric testing under section [specific number]. 9. If the work to be performed in the confined space includes hot work, adequate provisions for the hot work and corresponding control measures. (3) Before each shift, a competent person shall verify that the entry permit complies with the relevant plan. (4) The employer shall ensure that the entry permit, during the time period for which it applies, is readily available to every person who enters the confined space and to every person who performs related work with respect to the confined space.

The purpose of the entry permit is to communicate to workers the hazards that have been identified and the controls that are in place, before any worker enters the confined space or performs related work with respect to the confined space.

Certain safeguards that normally protect the worker may have to be removed or altered when repair or maintenance work is performed. When this occurs, the hazards involved need to be identified and a safe work system developed to eliminate or control these hazards. A permit is a document that, among other things, identifies the work to be done, the hazard(s) involved, and the precautions taken.

Entry is the action by which a person passes through an opening into a confined space. It is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the confined space, and includes ensuring work activities in that space.

When do I need an entry permit?

A separate entry permit is to be issued each time work is to be performed in a confined space and before any worker enters the confined space.

What if there are multiple entries for a limited duration, for the one job? Do we have to have a permit for each entry?

The permit requirements and duration for which the permit is valid are based on the hazard assessment conducted and the plan developed. The permit may be linked to each entry-task whose duration and criteria are specified in the plan and on the permit.

Does an entry permit need to be signed?

Although there is no requirement for a signature, the permit must be verified by a competent person before each shift. As a good due diligence practice, it would be reasonable to have this verification documented by signature, and the entry permit would be a logical place to document this.

Does an entry permit have to be posted at the entrance of the confined space?

No. However, the permit must be readily available to every person involved in the confined space activity and this would include knowledge of the permit's location.

What is a record of entry and exit?

The purpose of this requirement is to ensure that there is information about those who enter the space and leave the space. It is not meant to require a sign-in and out for every minor exit required to work in the space, such as leaving momentarily to obtain a nearby tool. The method of recording shall be as set out in the employer's program.

May I have one entry permit to cover workers entering 2 or more confined spaces, which are similar in construction and present the same hazards?

Each confined space must have its own, separate entry permit. For municipalities dealing with manhole entries, the employer must assess if each manhole entry is a separate confined space or if in fact each manhole is simply a separate entrance to the same confined space. This will depend on the hazard assessment and relevant plan.

11. Isolation of Energy and Control of Materials Movement

Industrial Establishments: Section 119.13 Construction Projects: Section 221.13 Mines and Mining Plants: Section 306 Health Care and residential Facilities: Section 43.12 Confined Spaces: Section 14	The employer shall, in accordance with the relevant plan, ensure that each worker entering a confined space is adequately protected, (a) against the release of hazardous substances into the confined space, (i) by blanking or disconnecting piping, or (ii) if compliance with subclause (i) is not practical in the circumstances for technical reasons, by other adequate means; (b) against contact with electrical energy inside the confined space that could endanger the worker, (i) by disconnecting, de-energizing, locking out and tagging the source of electrical energy, or (ii) if compliance with subclause (i) is not practical in the circumstances for technical reasons, by other adequate means; (c) against contact with moving parts of equipment inside the confined space that could endanger the worker, (i) by disconnecting the equipment from its power source, de-energizing the equipment, locking it out and tagging it, or (ii) if compliance with subclause (i) is not practical in the circumstances for technical reasons, immobilizing the equipment by blocking or other adequate means; and (d) against drowning, engulfment, entrapment, suffocation and other hazards from free-flowing material, by adequate means.

What is meant by "Isolation of energy"?

Workers must be protected against any hazards associated with the moving parts of equipment or electrical energy inside the confined space by ensuring that they are de-energized or otherwise controlled.

What is meant by "control of materials movement"?

The purpose of this requirement is to ensure that no material or contaminants enters or moves within the confined space through process lines, drains, vents, etc In addition, employers need to protect workers against any collapse or shift of material.

What is meant by "blanking or disconnecting piping"?

The purpose of this requirement is to ensure that no material or contaminants enters the confined space through process lines, drains, vents, etc.

Blanking is the insertion of a solid metal barrier, called a blank, between the flanges of two sections of pipe. In this instance the confined space extends to the blank. Disconnecting is the removal of a section of piping to ensure that no material can flow into the confined space. Note that care must be taken to ensure that high-pressure or toxic material cannot pass across the disconnected space – for example, high pressure steam can cross between the sections of pipe if the piece that has been removed is in-line with the two sections of pipe. (In this instance, the section removed should be an elbow or other fitting to ensure that the two sections of pipe are not in line).

What is an example of "other adequate means"?

"Other adequate means" can include such measures as a double-block and bleed system or the formation of a properly engineered "freeze plug", depending on how much protection they actually provide, i.e. the measures must be "adequate".

Do all moving parts of equipment inside a confined space need to be de-energized?

No, only equipment that could endanger a worker, such as unguarded equipment, or equipment that may have exposed moving parts or that may create a pinch point, require de-energizing or blocking to prevent movement. For example, a properly guarded pump or fan would generally not need to be de-energized. However, in a confined space in which flammable, combustible or explosive agents might accumulate, the same equipment would be de-energized or designed so that it does not create a spark.

What other means could be used to protect workers from contact with electrical energy?

Measures could include the installation of temporary barriers or shields or, if not practicable, the provision of adequate personal protective equipment.

Note: CSA Standard Z460 Control of Hazardous Energy – Lockout & Other Methods may be considered when developing best practices to comply with this section.

12. ATMOSPHERIC TESTING

Industrial Establishments: Section 119.17 Mines and Mining Plants: Section 310 Health Care and Residential Facilities: Section 43.16 Confined Spaces: Section 18	(1) The employer shall appoint a person with adequate knowledge, training and experience to perform adequate tests as often as necessary before and while a worker is in a confined space to ensure that acceptable atmospheric levels are maintained in the confined space in accordance with the relevant plan. (2) If the confined space has been both unoccupied and unattended, tests shall be performed before a worker enters or re-enters. (3) The person performing the tests shall use calibrated instruments that are in good working order and are appropriate for the hazards identified in the relevant assessment. (4) The employer shall ensure that the results of every sample of a test are recorded, subject to subsection (5). (5) If the tests are performed using continuous monitoring, the employer shall ensure that test results are recorded at adequate intervals. (6) The tests shall be performed in a manner that does not endanger the health or safety of the person performing them. (7) In this section, "sample" means an individual reading of the composition of the atmosphere in the confined space; "test" means a collection of samples.

Construction Projects: Section 221.16	(1) The employer shall appoint a competent worker to perform adequate tests as often as necessary before and while a worker is in a confined space to ensure that acceptable atmospheric levels are maintained in the confined space in accordance with the relevant plan. (2) If the confined space has been both unoccupied and unattended, tests shall be performed before a worker enters or re-enters. (3) The person performing the tests shall use calibrated instruments that are in good working order and are appropriate for the hazards identified in the relevant assessment. (4) The employer shall ensure that the results of every sample of a test are recorded, subject to subsection (5). (5) If the tests are performed using continuous monitoring, the employer shall ensure that test results are recorded at adequate intervals.

	(6) The tests shall be performed in a manner that does not endanger the health or safety of the person performing them. (7) In this section, "sample" means an individual reading of the composition of the atmosphere in the confined space; "test" means a collection of samples.

(Refer to the flow charts on Atmospheric Hazards at the end of this Section)

When is it necessary to conduct atmospheric testing?

Atmospheric testing is required when the relevant assessment determines that the confined space may contain atmospheric hazards. The testing must be done as often as necessary before and while a worker is in a confined space. The atmospheric hazards of concern include oxygen content outside the acceptable range of 19.5 to 23%, the potential accumulation of flammable, combustible, or explosive agents, or accumulation of atmospheric contaminants.

Who is responsible for performing atmospheric testing and for what reasons?

The employer must appoint a person with adequate knowledge, training and experience (or a competent worker as defined in the Regulation for Construction Projects) to perform adequate tests. The testing is required as often as necessary before and while a worker is in a confined space to ensure that acceptable atmospheric levels are maintained in the confined space in accordance with the relevant plan.

What are some of the requirements of atmospheric testing?

Representative sampling should take into consideration the presence of stratified atmospheres and pockets of contaminated air within the confined space. The selection of testing equipment will depend on the circumstances of the confined space, the nature of the work within the space, and knowledge of possible atmospheric hazards. Whenever practical, continuous monitoring should be considered. Equipment performance characteristics to be considered include, but are not limited to: principle of detection of the hazards of concern, specificity, interferences, detection concentration range, response time, calibration requirements, and intrinsically safe equipment for spaces with potential accumulation of flammable hazards.

All workers involved with confined space entry should be trained to understand the testing results, in accordance with the relevant plan.

What is meant by "calibrated instruments that are in good working order and are appropriate for the hazards identified in the relevant assessment"?

Instruments used for measuring atmospheric hazards should be calibrated as per manufacturers' requirements. The testing instrument must be selected and calibrated for the specific atmospheric hazards likely to be present in the space as identified in the relevant assessment. Equipment maintenance and calibration records should be kept.

May I use general survey instruments for atmospheric testing?

Yes, but for general survey instruments with sensors that respond to many different chemicals with similar properties, the person performing the tests and the users of test results need to understand the specificity and relative response characteristics of the instrument for proper interpretation of results. For example, a combustible gas instrument that uses pentane as the calibration gas will measure other combustible gases such as methane with a different response characteristic. In this case, the actual concentration of methane will be determined by applying a correction factor to the readout of the instrument.

When the exposure is to an unknown mixture of atmospheric contaminants or combustible gases, the testing results need to be interpreted by a person with adequate knowledge, training and experience about the confined space hazards of concern and the testing equipment.

When is continuous monitoring required?

Continuous monitoring is required:

- when performing hot work in a confined space that contains or is likely to contain an explosive or flammable gas or vapour.
- when the atmosphere in the confined space has been rendered inert, or
- as set out in the confined space plan.

When using continuous monitoring equipment, which may have data logging capability, are records required for test results?

Even though a continuous monitor may have data logging capability, results must still be recorded at adequate intervals as determined by the plan, above and

beyond the data logging printout or electronic storage. This ensures that workers are actually aware of the levels they are encountering and aware of any fluctuation that may be occurring in order to warn them of any unusual conditions as they develop. Monitors may have alarms; however, depending at what level they are set, they may not give the workers adequate warning of fluctuations or increases in atmospheric levels that should be investigated.

What is the required frequency for recording atmospheric test results?

The frequency of recording test results is determined by the confined space plan, based on the potential for accumulation and possible fluctuations of the atmospheric hazards as determined by the assessment.

What are the requirements for record keeping?

In general, the employer must retain atmospheric testing records for the longer of the following periods: one year after the document is created; or, the period that is necessary to ensure that at least the two most recent records of each kind that relate to a particular confined space are retained. For confined spaces with multi-employer involvement, the employer responsible for creating the record, shall retain the record. On construction projects, the records must be kept by the constructor or employer (as the case may be) for at least one year after the project is finished.

ATMOSPHERIC HAZARDS AND ATMOSPHERIC TESTING

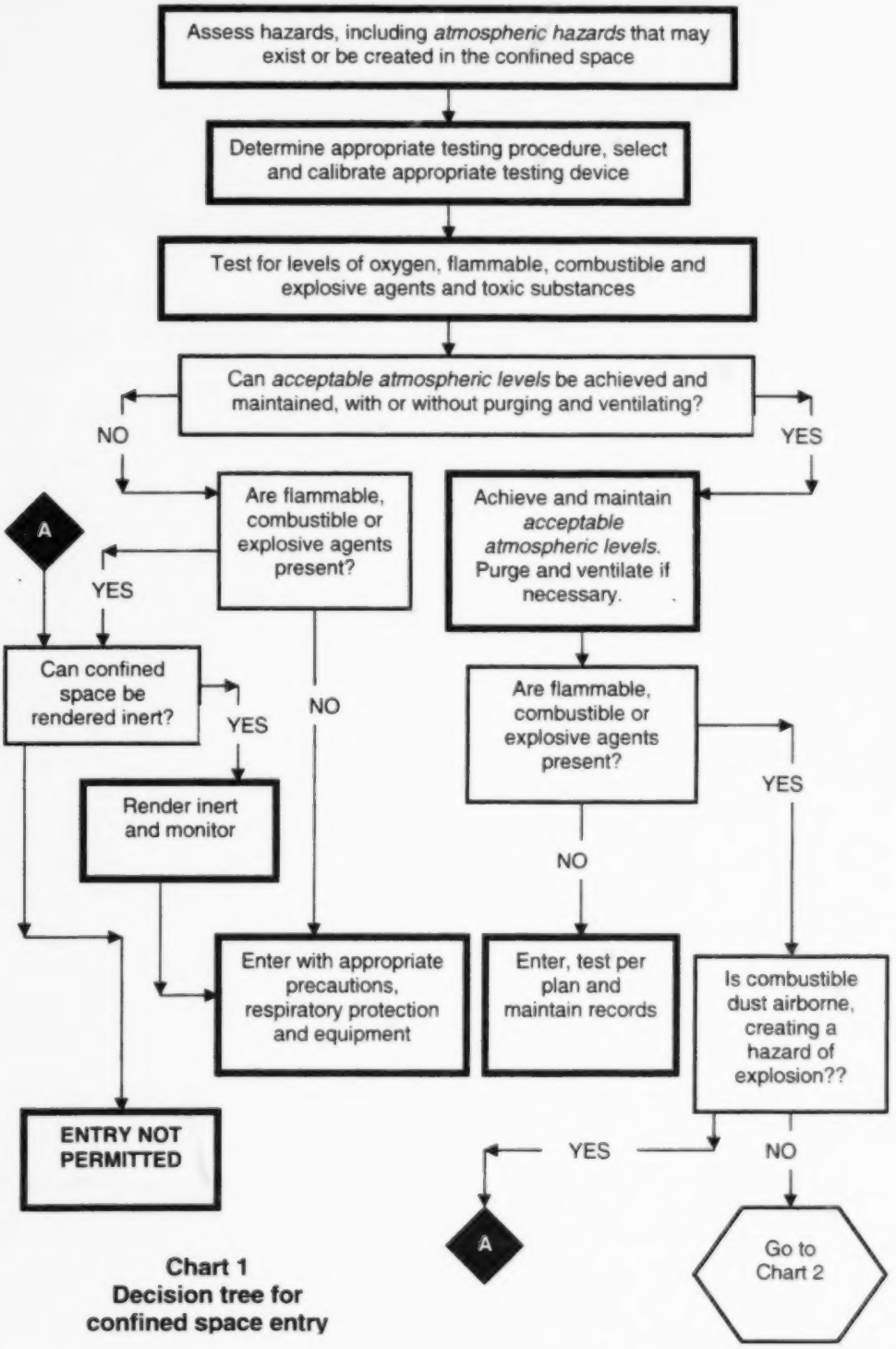

Assess hazards, including *atmospheric hazards* that may exist or be created in the confined space
Determine appropriate testing procedure, select and calibrate appropriate testing device
Test for levels of oxygen, flammable, combustible and explosive agents and toxic substances
Can *acceptable atmospheric levels* be achieved and maintained, with or without purging and ventilating?
NO
YES
Are flammable, combustible or explosive agents present?
Achieve and maintain *acceptable atmospheric levels.* Purge and ventilate if necessary.
A
YES
Can confined space be rendered inert?
YES
NO
Render inert and monitor
Are flammable, combustible or explosive agents present?
YES
NO
Enter with appropriate precautions, respiratory protection and equipment
Enter, test per plan and maintain records
Is combustible dust airborne, creating a hazard of explosion??
ENTRY NOT PERMITTED
YES
NO
A
Go to Chart 2

Chart 1
Decision tree for confined space entry

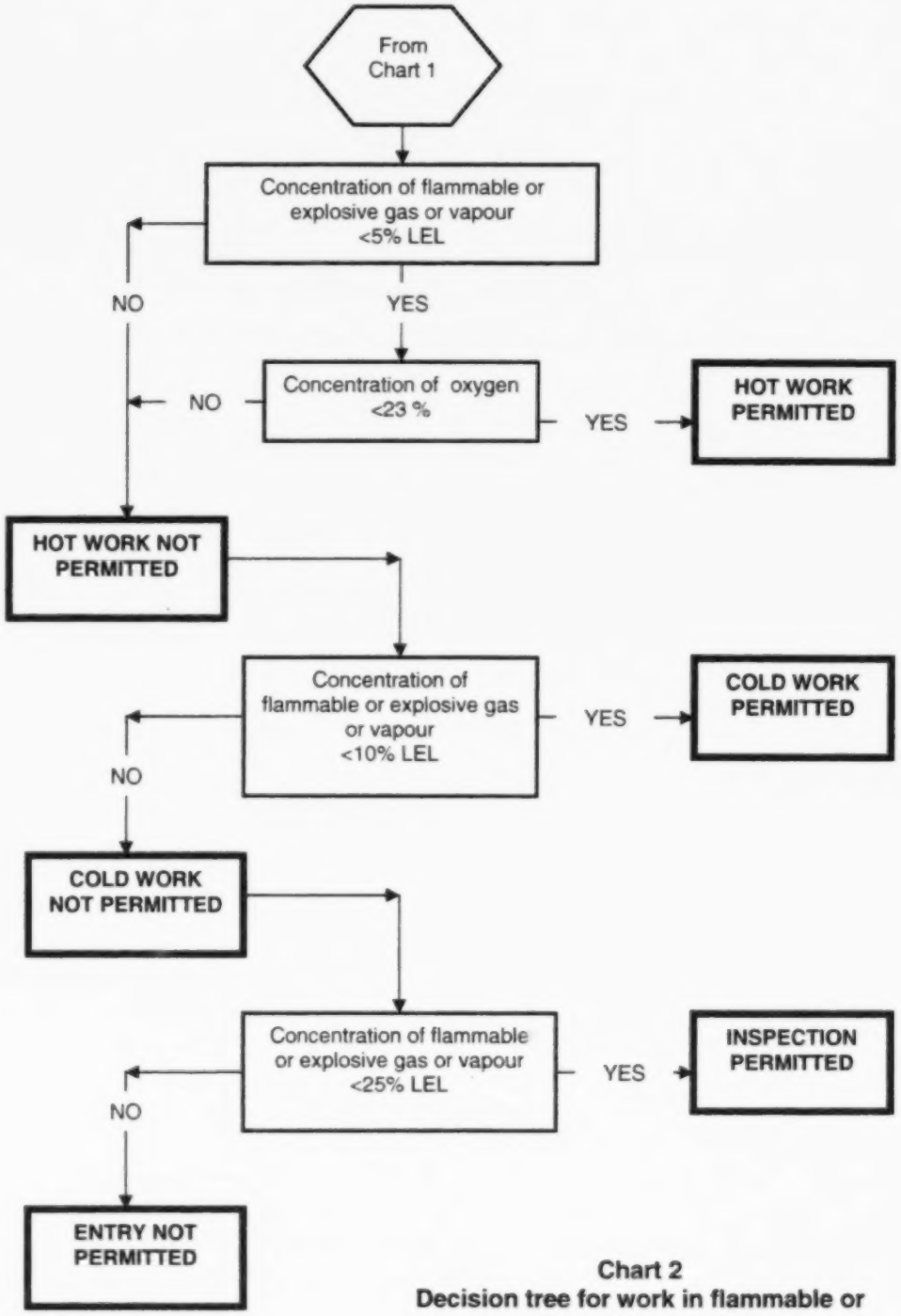


Chart 2
Decision tree for work in flammable or explosive gas or vapour

13. VENTILATION AND PURGING

Industrial Establishments: Section 119.19 Mines and Mining Plants: Section 312 Health Care and Residential Facilities: Section 43.8 Confined Spaces: Section 20	(1) This section applies only in respect of atmospheric hazards described in clause (b) or (c) of the definition of "atmospheric hazards" in section [of specific regulation referring to atmospheric hazard definition] (2) If atmospheric hazards exist or are likely to exist in a confined space, the confined space shall be purged, ventilated or both, before any worker enters it, to ensure that acceptable atmospheric levels are maintained in the confined space while any worker is inside. (3) If mechanical ventilation is required to maintain acceptable atmospheric levels, an adequate warning system and exit procedure shall also be provided to ensure that workers have adequate warning of ventilation failure and are able to exit the confined space safely. (4) If compliance with subsection (2) is not practical in the circumstances for technical reasons, (a) compliance with subsection (3) is not required; and (b) a worker entering the confined space shall use, (i) adequate respiratory protective equipment, (ii) adequate equipment to allow persons outside the confined space to locate and rescue the worker if necessary, and (iii) such other equipment as is necessary to ensure the worker's safety. (5) The equipment mentioned in subclauses (4) (b) (i), (ii) and (iii) shall be inspected by a person with adequate knowledge, training and experience, appointed by the employer, and shall be in good working order before the worker enters the confined space.
Construction Projects: Section 221.18	Same as above, except (5) is not in the section, since the requirement for inspection of equipment is with the supervisor or a competent person at any construction project.

What is the difference between "purging" and "ventilating"?

"Purging" involves *removing* contaminants inside the confined space by displacement with air to *achieve* acceptable atmospheric levels. For example, if a confined space originally contained a toxic gas, air would be blown into the space to reduce the concentration of the toxic gas to below the appropriate atmospheric exposure level.

After the contaminants have been removed ("purged"), the confined space may be ventilated.

"Ventilation" means the continuous provision of fresh air into the confined space by mechanical means to *maintain* acceptable atmospheric levels. It must be continued while work is being carried out within the space, to maintain an acceptable oxygen concentration, to provide protection in case of accidental release of chemicals, to remove contaminants generated by the work performed, or to cool the enclosure.

Ventilation involves displacing air and diluting it through the introduction of fresh air (forced-air) or the continuous removal of contaminants by local exhaust ventilation for point sources. To ensure adequate ventilation, the points of air supply and exhaust should be separated as far as possible. Openings must be provided for the entry of clean replacement air or to allow the exhaust of air. Pure oxygen must not be used to ventilate a confined space.

What is "inerting"?

"Inerting" is a special form of purging and ventilating. Inerting involves purging oxygen from a confined space using an inert gas (such as nitrogen, carbon dioxide or argon) to remove the hazard of fire or explosion. The concentration of oxygen is decreased to below the level that can support combustion. Following the purging operation the oxygen concentration is continuously monitored and the confined space may be ventilated using the inert gas to ensure that the concentration of oxygen does not increase. The inert gases will create an unsafe atmosphere (oxygen deficiency) and therefore workers entering the confined space should use appropriate supplied air-respirators.

What is an example of "an adequate warning system" to indicate ventilation failure?

A warning system could be an audible or visual alarm, or both, that indicates that the ventilation has failed. The alarm should be activated by a flow or pressure switch in the air stream rather than by electrical failure or other motive power failure. A pressure or flow switch would ensure that if the fan belt fails, for example, or the airflow is somehow blocked, the alarm is activated.

ACCEPTABLE ATMOSPHERIC LEVELS

Industrial Establishments: Section 119.1 Health Care and Residential Facilities: Section 43 Mines and Mining Plants: Section 294 Confined Spaces: Section 1	In this Part or Regulation "acceptable atmospheric levels" means that, (a) the atmospheric concentration of any explosive or flammable gas or vapour is less than, (i) 25 per cent of its lower explosive limit, if paragraph 1 of subsection [see specific regulation number] applies, (ii) 10 per cent of its lower explosive limit, if paragraph 2 of subsection [see specific regulation number] applies, (iii) 5 per cent of its lower explosive limit, if paragraph 3 of subsection [see specific regulation number] applies, (b) the oxygen content of the atmosphere is at least 19.5 per cent but not more than 23 per cent by volume, and (c) the exposure to atmospheric contaminants does not exceed any applicable level set out in a regulation made under the Act and listed in Table 1;
Construction Projects: Section 221.2	(a) and (b) are the same as in the above provisions. (c) if atmospheric contaminants, including gases, vapours, fumes, dusts or mists, are present, their concentrations do not exceed what is reasonable in the circumstances for the protection of the health and safety of workers;

Why is section 221.2(c) in the Regulation for Construction Projects worded differently from the other regulations?

Different regulations may apply on a construction project due to the nature of the work. Construction projects are exempt from the Regulation for Control of Biological or Chemical Agents (Reg. 833) and the Designated Substance Regulations, other than the Regulation for Asbestos on Construction Projects and in Building and Repair Operations (O. Reg. 278/05). Clause (c) of the definition of "acceptable atmospheric levels" in section 221.2 of the Regulation for Construction Projects (O. Reg. 213/91) applies and exposures to atmospheric contaminants must not exceed what is reasonable in the circumstances.

How are acceptable atmospheric levels related to atmospheric hazards?

Atmospheric hazards are considered to determine if a space is a confined space. Acceptable atmospheric levels are those levels that must be maintained when a worker is in a confined space in order to prevent occupational illness or injury.

14. HOT WORK

What is "hot work"?

"Hot work" is work that could produce a source of ignition, such as a spark or open flame. Examples of hot work include welding, cutting, grinding and the use of non-explosion proof electrical equipment.

What is "cold work"?

"Cold work" is work that cannot produce a source of ignition. Examples of cold work include valve adjustment and brush painting.

What precautions are required to perform hot work in the presence of a combustible dust or mist?

The space should be ventilated or purged to reduce the combustible dust or mist airborne concentration to a level below that which may create a hazard of explosion.

If ventilation or purging cannot reduce the combustible dust or mist airborne concentration to a level below that which may create a hazard of explosion, the space must be rendered inert by adding an inert gas and be continuously monitored to ensure the atmosphere remains inert. Workers must wear adequate respiratory protective equipment and adequate equipment to allow persons outside the confined space to locate and rescue them, if necessary.

What precautions are required to perform hot work in the presence of an explosive or flammable gas or vapour?

In order to perform hot work in the presence of an explosive or flammable gas or vapour, the following precautions must be taken:

a) The space is purged and continuously ventilated to maintain an atmosphere of less than 5% of the LEL;

b) The space is purged and continuously ventilated to maintain an oxygen concentration of less than 23%;

c) The atmosphere in the confined space is continuously monitored;

d) The entry permit includes adequate provisions for hot work and details the appropriate measures to be taken; and

e) An alarm system and exit procedure are in place to provide adequate warning and allow safe escape if the levels in a) or b) above are exceeded. It is good practice to incorporate a safety factor that provides for adequate warning should the levels be approached.

Alternately, the space must be rendered safe by inerting with an inert gas and continuously monitoring the atmosphere, particularly with regard to oxygen concentration. Workers must wear adequate respiratory protective equipment and equipment to allow persons outside the confined space to locate and rescue them, if necessary.

May I perform hot work in a confined space if there are no flammable gases, vapours or dusts present?

Yes, as long as all the appropriate measures for confined space entry have been taken.

15. ON-SITE RESCUE PROCEDURES

Industrial Establishments: Section 119.10 and 119.11 Mines and Mining Plants: Section 303 and 304 Health Care and Residential Facilities: Section 43.9 and 43.10 Confined Spaces: Section 11 and 12	[specific number] (1) The employer shall ensure that no worker enters or remains in a confined space unless, in accordance with the relevant plan, adequate written on-site rescue procedures that apply to the confined space have been developed and are ready for immediate implementation. (2) Before a worker enters a confined space, the employer shall ensure that an adequate number of persons trained in the matters listed in subsection (3) are available for immediate implementation of the on-site rescue procedures mentioned in subsection (1). (3) The persons shall be trained in, (a) the on-site rescue procedures mentioned in subsection (1); (b) first aid and cardio-pulmonary resuscitation; and (c) the use of the rescue equipment required in accordance with the relevant plan. [specific number] (1) The employer shall ensure that the rescue equipment identified in the relevant plan is, (a) readily available to effect a rescue in the confined space; (b) appropriate for entry into the confined space; and (c) inspected as often as is necessary to ensure it is in good working order, by a person with adequate knowledge, training and experience who is appointed by the employer. (2) The inspection under clause (1) (c) shall be recorded in writing by the person, and the record of the inspection may be incorporated into the entry permit under section [specific number]. (3) The employer shall establish methods of communication that are appropriate for the hazards identified in the relevant assessment, and shall make them readily available for workers to communicate with the attendant described in section [specific number].

Construction Projects: Section 221.10 and 221.11	221.10 (1) The employer shall ensure that no worker enters or remains in a confined space unless, in accordance with the relevant plan, adequate written on-site rescue procedures that apply to the confined space have been developed and are ready for immediate implementation. (2) Before a worker enters a confined space, the employer shall ensure that an adequate number of persons trained in the matters listed in subsection (3) are available for immediate implementation of the on-site rescue procedures mentioned in subsection (1). (3) The persons shall be trained in, (a) the on-site rescue procedures mentioned in subsection (1); (b) first aid and cardio-pulmonary resuscitation; and (c) the use of the rescue equipment required in accordance with the relevant plan. 221.11 (1) The employer shall ensure that the rescue equipment identified in the relevant plan is, (a) readily available to effect a rescue in the confined space; (b) appropriate for entry into the confined space; and (c) inspected by a competent worker as often as is necessary to ensure it is in good working order. (2) The inspection under clause (1) (c) shall be recorded in writing by the competent worker, and the record of the inspection may be incorporated into the entry permit under section 221.9. (3) The employer shall establish methods of communication that are appropriate for the hazards identified in the relevant assessment, and shall make them readily available for workers to communicate with the attendant described in section 221.14.

May we contract out rescue services?

Yes. However, depending upon the hazard assessment and risks involved, this might not be an adequate rescue plan. The hazards must be assessed and an adequate timely response must be ensured based on the potential hazard facing a worker. For example, in the event that workers are in danger in the confined space, a timely emergency removal system would be the difference in minutes that make it a rescue rather than retrieval. Rescue personnel must be available for immediate implementation of the on-site rescue procedures.

Even If choosing to contract out, the employer retains the duty to ensure training of the contracted rescue personnel and the appropriate use of personal protection continues.

What rescue equipment can we use?

The equipment to use will be dependent upon the hazards in the confined space, and the relevant plan. Examples of safety equipment include harnesses and lifelines, hoist/retrieval systems, self-contained breathing apparatus, airline respirators, and other personal protective equipment.
It is of paramount importance when choosing the equipment to be used in a rescue situation, to take into account the dimensions of the entry/exit or access/egress points to the confined space, that they should be compatible with the dimensions of the rescue equipment and rescue procedures.

Where do rescue personnel have to be located?

Rescue personnel must be available and ready to immediately implement the written on-site rescue procedures should a rescue be required as per the plan.

May we use 911 emergency services as our "on-site rescue"?

No, calling 911 as your rescue plan is not considered to be an "on-site rescue procedure" which can be "ready for immediate implementation" for the purpose of rescuing a worker from a confined space. Emergency services do not replace the requirement for on-site rescue procedures.

Employers remain solely responsible for ensuring that there are adequate on-site rescue procedures that are ready for immediate implementation in order to effectively remove a worker who has been overcome in a confined space.

May the rescue team enter the confined space to effect a rescue rather than retrieve the injured worker from outside of the confined space?

Yes. The confined space entry plan must be provided with on-site rescue procedures as determined by the hazards for that confined space. In some cases, these may have to be performed from outside the space; however, in some other scenarios the rescue personnel may need to enter the space. If entry is required to perform a rescue, rescue personnel must be properly protected and trained against all hazards within the confined space.

May the attendant become part of the rescue team once a rescue has been activated?

No, not unless the attendant has been replaced by another person knowledgeable in attendant duties. During a rescue, an attendant must remain in place stationed outside and near the entrance to the confined space. The attendant may assist the rescue as long as the work does not impede the attendant's duties.

What training do on-site rescue workers require?

In addition to general confined space training, the employer must ensure that an adequate number of on-site rescue workers have the following training:

- First aid and cardiopulmonary resuscitation;
- On-site rescue procedures in accordance with the relevant plan; and
- Use of the rescue equipment required by the relevant plan.

Not all members of the team might need to have all 3 elements of training so long as the team as a whole has the adequate training. The amount of training required by each individual member of the team will depend on the particular situation and plan.

What level of first aid training and rescue procedure training is required?

The regulation does not define the level of training required. However employers are required to determine the level of training required based on the assessment and the relevant plan and the written on-site rescue procedures.

16. MEANS OF ENTERING AND EXITING

Industrial Establishments: Section119.15	An adequate means for entering and exiting shall be provided for all workers who enter a confined space, in accordance with the relevant plan.
Mines and Mining Plants: Section 308	
Health Care and Residential Facilities: Section 43.14	
Confined Spaces: Section 16	
Construction Projects:	No section since construction regulation already makes provisions for access and egress.

What are examples of means of entry or exit?

Also known as 'access and egress', the purpose of this section is to ensure that employers provide for safe exit and entry as per the plan. For example: openings into confined spaces must be large enough to permit the entry of workers wearing safety equipment; a manhole should be at least 24 inches in diameter; hinged covers, doors, etc., should be provided with a means whereby they can be locked in the open position. Ladders or other suitable means should be provided where necessary to give ready access and egress. Ladders should be well secured.

The size of access and egress areas should be considered when choosing personal protective equipment to be used by the workers entering the confined space. The same considerations should be made when setting up rescue procedures and choosing rescue workers' personal protective equipment and rescue equipment.

17. PREVENTING UNAUTHORIZED ENTRY

Industrial Establishments: Section 119.16 Mines and Mining Plants: Section 309 Health Care and Residential Facilities: Section 43.15 Confined Spaces: Section 17 Construction Projects: Section 221.15	If there is a possibility of unauthorized entry into a confined space, the employer shall ensure that each entrance to the confined space, (a) is adequately secured against unauthorized entry; or (b) has been provided with adequate barricades, adequate warning signs regarding unauthorized entry, or both.

Only authorized personnel are allowed entry to the confined space, in accordance with the procedures identified in the plan.

The employer must ensure that measures and procedures are put in place to adequately secure each entrance to the confined space against unauthorized or accidental entry. These measures and procedures may include, but are not limited to, adequate barricades, adequate warning signs, or any combination thereof. In addition, while workers are in a confined space, there is a requirement for an attendant who should have control over access.

In some circumstances, use of signs is not practical, such as for every manhole and grate. A tool is usually required for removal of the cover, and therefore, it would likely be considered secure against entry.

18. Roles and Responsibilities

What is the difference between a person with adequate knowledge, training and experience, a competent worker, and a competent person?

In the context of confined spaces, the two phrases, "person with adequate knowledge, training and experience" and "competent worker" should be considered synonymous. The first term is used in the confined space provisions of the Regulations for Industrial Establishments (Reg. 851), Mines and Mining Plants (Reg. 854), Health Care and Residential Facilities (O. Reg. 67/93) and Confined Spaces (O. Reg. 632/05). The second term is used in the Regulation for Construction Projects (O. Reg. 213/91).

A person with adequate knowledge, training and experience or a competent worker can include a worker, a supervisor, a consultant, or anyone who has, in addition to the "academic" knowledge of the task at hand, a hands-on knowledge in safely performing the work, a knowledge of the associated hazards, the possible controls, and the legal requirements in order to enact the necessary controls to protect the health and safety of the workers in and about the confined space. In other words, this person or persons, (as it may be a group of people), must be able to perform the specific task or tasks adequately.

A "**competent worker**" is defined in the construction regulation, in relation to specific work – in this case it would be related to the confined space:

> *"competent worker", in relation to specific work, means a worker who,*
>
> *(a) is qualified because of knowledge, training and experience to perform the work,*
>
> *(b) is familiar with the Occupational Health and Safety Act and with the provisions of the regulations that apply to the work, and*
>
> *(c) has knowledge of all potential or actual danger to health or safety in the work;*

A **"competent person"** is different from a person having "adequate knowledge, training, and experience" or from a "competent worker". There is an added responsibility of also having "to organize the work", which usually is associated with a supervisor's responsibility. The term "competent person" is defined in the OHSA as follows:

"competent person" means a person who,

(a) is qualified because of knowledge, training and experience to organize the work and its performance,

(b) is familiar with this Act and the regulations that apply to the work, and

(c) has knowledge of any potential or actual danger to health or safety in the workplace;

While a supervisor may have had a role in organizing the work, he or she may not necessarily be competent to carry out the specific task or tasks.

A **competent person** is required for:

- Developing and implementing the confined space plan
- Verification that the entry permit continues to comply with the plan, prior to the start of each shift (and before first, initial entry).

Persons with adequate knowledge, training, and experience or competent workers (for Construction) would be the ones called upon to:

- Carry out an adequate assessment of the hazards in the confined space before any worker enters the confined space
- Sign and date the assessment and provide it to the employer
- Conduct the training of workers before they are allowed to enter the confined space
- Inspect the rescue equipment to ensure it is in good working order
- Perform adequate tests as often as necessary to ensure that acceptable atmospheric levels are maintained in the confined space, in accordance with the relevant plan.
- Inspect the personal protective equipment used by a worker entering the confined space

What are the rights of the joint health and safety committee or health and safety representative on a construction project?

The JHSC or health and safety representative has a right to the following documents relating to confined space:

- a copy of coordination document,
- a copy of the program
- a copy of the assessment when requested,
- worker training records

What are the rights and responsibilities of the joint health and safety committee or health and safety representative in a workplace, except a construction project?

The JHSC or health and safety representative has a right to the following documents relating to confined spaces:

- a copy of coordination document
- a copy of the program
- a copy of assessment, when requested

The JHSC or health and safety representative also has the following consultation rights:

- Be consulted by the employer with regard to the development and maintenance of the confined space program
- Be consulted in regard to the development of worker training
- Be consulted by the employer, with regard to reviewing the confined space training regularly, on an annual basis, as well as whenever there is a change in circumstances.

What are the duties of an attendant?

An attendant is a worker who is trained in the hazards of confined spaces and whose primary responsibility is to monitor and assist the workers in the confined space.

Assistance includes maintaining communication with the workers via an adequate communication system, calling for emergency rescue, providing confined space workers with fresh air packs and other personal protective equipment.

The attendant is not to enter the confined space, and his/her location and activities will be determined by the hazard assessment and the resulting confined space plan.

Where does the attendant have to be located?

The attendant has to be located outside and near the entrance of the confined space. As well he/she must be in constant communication with the workers inside the space and able to immediately summon a rescue response should it be required.

Can the attendant perform any other work while being the attendant?

Only if that work does not impede the attendant's duties.

What is meant by an attendant being "in constant communication with all workers inside the confined space"?

The attendant must be able to send and receive information to and from the workers inside the confined space in order to perform the duties of the attendant. How that is achieved is not specified; therefore, communications may be verbal or may include hand signals, radios, etc. The method will be determined by the employer and set out in the plan, based on the types of hazards identified in the assessment and the physical aspects of the confined space.

19. DOCUMENTS

What are the requirements for written documentation and which ones can be incorporated into the entry permit?

The following written documents are required:

1. co-ordination document (if applicable)*
2. program *
3. assessment
4. plan
5. training records
6. entry permit
7. on-site rescue procedures *
8. on-site rescue equipment inspection records
9. air testing results

All of the above documents may be incorporated within the "entry permit" except for those with an asterisk.

How long do the above documents have to be retained?

All of the above documents must be retained for at least 1 year after they are created, and at least the two most recent records of each document must be retained, with the exception of the confined space program which must be maintained at all times if the workplace includes a confined space that workers may enter to perform work. .

For construction projects these documents must be retained for the duration of the project, and at least one year after the completion of the project.

Where must these documents be located?

For all workplaces except for construction projects:

- The co-ordination document and program document must be provided to the JHSC or Health and Safety representatives and other employers, where applicable.

- The assessment document must be provided upon request to the JHSC, or Health and Safety representative, or to the workers if there is no representation.
- Entry permits must be readily available to every person who enters the confined space or performs related work during the time for which it applies.
- The plan, training records, on-site rescue procedures, rescue equipment inspection and air testing results documents should be readily available at the workplace.

For construction projects:

- The employer must keep available for inspection at the project the assessment, plan, co-ordination document, record of training, entry permit, record of inspection of rescue equipment, and air testing records.
- After the completion of the project, the employer or the constructor must keep a copy of these documents for at least one year.

APPENDIX A – TABLE ONE

Regulation	Title
R.R. O. 1990, Reg. 833, as amended	Control of Exposure to Biological or Chemical Agents
R.R. O. 1990, Reg. 835, as amended	Acrylonitrile
R.R. O. 1990, Reg. 836, as amended	Arsenic
R.R. O. 1990, Reg. 837, as amended	Asbestos
R.R. O. 1990, Reg. 839, as amended	Benzene
R.R. O. 1990, Reg. 840, as amended	Coke Oven Emissions
R.R. O. 1990, Reg. 841, as amended	Ethylene Oxide
R.R. O. 1990, Reg. 842, as amended	Isocyanates
R.R. O. 1990, Reg. 843, as amended	Lead
R.R. O. 1990, Reg. 844, as amended	Mercury
R.R. O. 1990, Reg. 845, as amended	Silica
R.R. O. 1990, Reg. 846, as amended	Vinyl Chloride

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